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Journal of the Society of Arts.

FRIDAY, SEPTEMBER 28, 1855.

SOCIETY'S VISIT TO PARIS.

The Council assembled at 14, Rue du Cirque, on the 3rd instant, when the Secretary reported that he had been in communication with his Excellency Lord Cowley, who, at the request of the Secretary when in Paris a few weeks since, had kindly undertaken to ask an audience of His Imperial Majesty the Emperor of the French, for the presentation of the address from the Society and its associated Institutions, but that at present no day had been fixed. The Secretary further reported that he had learnt that His Imperial Highness the Prince Napoleon, the President of the Imperial Commission for the Exposition Universelle, would leave Paris on Wednesday morning for a visit to the country, of some days' duration, and that under these circumstances His Highness could not fix a day for the reception of the address intended for him, but that His Imperial Highness had signified his desire that the address should be transmitted to him, and that the members of the Council should be presented to His Highness in the Palais de l'Industrie, during his visit there that afternoon. Accordingly the Chairman, accompanied by Lord Ebrington, V.P., M.P.; Mr. J. Scott Russell, V.P.; Mr. Joseph Glynn, Member of Council; Mr. W. B. Simpson, Mr. P. Palmer, members of the Paris Visit Committee, with the Secretary, proceeded to the Exhibition building, and had the honour of being presented to His Imperial Highness by M. Le Play, the Commissioner General.

The following address was placed in the hands of M. Le Play, for presentation to His Imperial Highness on his return to Paris:—

"May it please your Imperial Highness,

"We, the Council and Members of the incorporated Society instituted at London in 1754, for the Encouragement of Arts, Manufactures, and Commerce, together with the representatives of the Literary, Scientific, and Mechanics' Institutions throughout Great Britain and Ireland associated with us, beg leave to congratulate your Imperial Highness on the great success of the Universal Exhibition of all Nations.

"In accordance with the recommendation of His Royal Highness the Prince Albert, our illustrious President, we have visited the splendid capital of France to mark the progress of Arts, Manufactures, and Commerce. We have noted with great satisfaction their rapid advancement since the opening of our own Exhibition in 1851, whose universality, its dominant idea, was due to the comprehensive views of our Royal President. On every side we witness manifold proofs of the energetic will and organising power which have rendered the name of Napoleon so illustrious. The indefatigable zeal of your Imperial Highness has happily realised the grand conceptions of His Majesty the Emperor, and we are thus once more permitted to behold the great spectacle of the confederacy of nations, and the reunion of those men whose works and discoveries are the true glory of our age. It is only by gatherings such as these that we can hope to reunite in the firm bonds of lasting peace the great family of the nations of the globe. The moral good thus accomplished will be of more value than even the material results. The harmonious accord of the two great nations, France and England, which stand confessedly at the head of European civilisation, is the surest pledge of its conservation and advancement.

"Accept, Illustrious Prince, the homage of our profound respect,

"Given under our Common Seal this 8th day of September, 1855.

"JAMES BOOTH, *Chairman of the Council.*

"P. LE NEVE FOSTER, *Secretary.*"

On Tuesday morning, the 4th inst., at 10 o'clock, the Members of the Society and the representatives of the associated Institutions, with their friends, headed by the Chairman, proceeded to pay their first visit to the Exhibition. They were received at the grand entrance of the building by M. Le Play and M. Arles Dufour, the Secretary of the Imperial Commission, who, in the name of the Commissioners, bade them welcome, and expressed the gratification which the Commission felt at a visit from a Society which had taken so prominent a part in originating the Great Exhibition of 1851. The Members then dispersed to view the Exhibition.

On Wednesday morning, at nine o'clock, the Chairman, accompanied by Mr. Robert Stephenson, M.P., Mr. J. Scott Russell, F.R.S., and other members of the Society, and representatives, visited the Machinery Department of the Exhibition in the Annex, over which they were conducted by Captain Fowke, of the Royal Engineers. At 12 o'clock, Mr. Macarthur, the Commissioner for New South Wales, conducted a party of the members over the Australian department; and afterwards Mr. Logan, the Commissioner for the Canadas, showed the Canadian products.

On Thursday the Chairman, accompanied by a large party of the members, visited the Palais des Beaux Arts, under the guidance of Messrs. Leighton and F. S. Carey. The members afterwards visited the Tomb of Napoleon, at the Invalides.

On Friday the members visited the Palace of the Luxembourg, and afterwards the Pantheon, from whence they proceeded to the Louvre. In the evening, a grand reception was given by the Imperial Commission to the members of the Society and the representatives of the associated Institutions and their friends. The reception was held in the Palais de l'Industrie, and the company were received, in the name of the Commission, by MM. Thibaudeau and Arles Dufour. About 500 persons were present. Previous to the reception a dinner was given by the Imperial Commission, at which the following members of the Society and representatives of the associated Institutions had the honour of being invited:—Earl Grey, Viscount Ebrington, M.P., John G. Appold, F.R.S., Edward Baines, E. Ball, M.P., H. G. Bohn, Rev. Dr. Booth, F.R.S., John Brady, M.P., General Buckley, M.P., F. S. Cary, John Cassell, Edwin Chadwick, C.B., R. L. Chance, W. Fothergill Cooke, John G. Grace, W. Ewart, M.P., Benjamin Fothergill, Capt. Fowke, R.E., Edward Glynn, Joseph Glynn, F.R.S., Peter Graham, William Hawes, Chandos W. Hoskyns, Herbert Ingram, W. Lane Joynt, J. C. Macdonald, Rev. Muirhead Mitchell, Philip Palmer, Alexander Redgrave, C. B. Robinson, Dr. Forbes Royle, F.R.S., John Scott Russell, F.R.S., W. Wilson Saunders, F.R.S., C. W. Siemens, W. B. Simpson, J. Jobson Smith, James Scott Smith, Thomas Sopwith, F.R.S., Richard J. Spiers, Robert Stephenson, M.P., F.R.S., William Turton, Thomas Twining, jun., W. Weallens, Thomas Woolcombe, and P. Le Neve Foster, the Secretary.

After dinner M. Thibaudeau, who spoke in English, proposed the health of His Royal Highness Prince Albert, in the following terms:—

"GENTLEMEN,—His Imperial Highness Prince Napoleon has charged my colleague, M. Arles Dufour, and me, with the duty of receiving you, and entrusted me with the honour of proposing the health of H.R.H. Prince Albert, your President, and of the Society of Arts. We hope that you will make yourselves welcome, and that you will join in those sentiments which your gracious Queen was good enough to express during her visit, and which every Englishman at the present time proves the truth of by coming amongst us. You who have been the first to

realise the idea of Exhibitions of all Nations must feel a peculiar satisfaction in viewing the marvels of intelligence and industry which surround us. Nevertheless, whatever may be the results of such Exhibitions as these, there is no bound to progress in our time. Science, art, and industry have their great difficulties; some must be turned, others must be taken by assault. In our progress we encounter Malakoffs and Great Redans, but we have also our glorious days of victory, as at Alma, Inkermann, and Traktir. Let us continue to march hand-in-hand in this career of progress, as our brave soldiers fight side by side for the conquest of Sebastopol."

Lord Ebrington, as a Vice-President of the Society, replied to the toast, thanking H. I. H. Prince Napoleon and the Imperial Commission for their hospitable reception, and concluded by proposing the health of His Majesty the Emperor, "who by his wisdom and genius had realised that which his predecessors had in vain attempted, the founding an alliance between the two countries on the firm basis of community of glory and community of interest."

Although it had been notified in the *Moniteur* that the stated receptions for the season had ceased, yet on the arrival of the Society in Paris, the Imperial Commission determined to signalise their visit by a public dinner to a limited number, and by a reception in the evening to the whole of the members and representatives.

On Saturday, at half-past nine, Mr. Sopwith, F.R.S., undertook to conduct a party over the mineral products exhibited in the Annexe; and afterwards Mr. Macarthur showed the Australian products to such members as had been unable to take advantage of his guidance on the previous occasion. At 12 o'clock, Mr. Peter Graham, one of the members of the Council, took a large party through the carpet, lace, furniture, and embroidery departments. Mr. Hobbs also explained to a party the various locks exhibited. The Secretary also took a party over the Canadian collection.

On Monday, at half-past nine, Dr. Royle showed the Indian products in the Annexe, and afterwards the Chairman, accompanied by a large body of the members and representatives, visited the Conservatoire des Arts et Metiers, and were conducted over the establishment by M. de Tresca, the *Sous-Directeur*. During this visit some experiments were made testing the power of certain pumps exhibited in the Palais de l'Industrie. General Morin's registering dynamometer was used to determine the force employed. A new arrangement for producing a steady and continuous light by electricity was also shown. At four o'clock, a party of the members visited the Model Lodging-house, exhibited in the grounds of the Palais de l'Industrie. The house was shown to the members by a gentleman deputed by Mr. G. Clark, the exhibitor.

On Tuesday, a large body of members and representatives, accompanied by the Chairman, visited the Chateau de Fontainebleau. The party, consisting of about 120 persons, afterwards dined together at the Hotel de la Ville de Lyons, where a dinner had been specially arranged by the Secretary, who went to Fontainebleau the previous evening.

On Monday and Tuesday, from two o'clock till four, Mr. Murray undertook to exhibit to the members the models of Irish fisheries, with live fish.

On Wednesday, the 12th, at 11 o'clock, the members visited the Hotel des Monnaies, and were conducted over the establishment, and shown the working departments, by Monsieur Hullot. In the afternoon a party visited the cemetery of Pere la Chaise, under the guidance of Mr. Winsor.

Thursday, 13th.—The visit to the collection of Prince Salziocoff, under the guidance of Mr. H. Cole, and to the Agricultural department of the Exhibition, under the guidance of Mr. C. Wren Hoskyns, did not take place, owing to that day being appointed for the public rejoicings for the taking of Sebastopol.

On Friday, the 14th, a party of the members were conducted over the Prussian department of the Exhibition, by M. de Viebahn, the Prussian Commissioner.

Saturday the 15th.—This day was fixed for the inauguration of the "Exposition Economique," forming a special department of the Exposition Universelle, and the members of the Society and the representatives were invited to attend. The party assembled in the Salon de l'Empereur. In addition to many well-known members of the Société d'Economie Charitable of Paris, the Commissioners of nearly every nation exhibiting in the building, General Morin, M. de Rouville, and the members of the Imperial Commission, there were present the following members of the Society of Arts:—Earl Grey, Viscount Ebrington, H. Cole, C.B., J. Scott Russell, T. Twining, jun., T. Winkworth, E. Chadwick, C.B., C. Wren Hoskyns, R. P. Fauntleroy, Dr. Ellis, Henry Johnson, W. C. Dutton, J. H. Murchison, and others. At one o'clock, they proceeded with M. Arles Dufour to the special building erected in the grounds of the Palais de l'Industrie. M. Arles Dufour addressed the meeting as follows:—

"Our President, His Imperial Highness the Prince Napoleon, and my colleague, M. Le Play, greatly regret that it is not in their power to attend at the opening of this interesting department of the Exhibition, the formation of which is in a great measure due to their persevering exertions. But they would regret still more any delay in the opening, however small, which would otherwise have deprived us of the presence of the members of the Society of Arts of London. We must not forget that the idea of this special Exhibition was submitted by that honourable Society to her Majesty the Empress, who received and patronised it as she receives and patronises everything which relates directly or indirectly to the well-being of the labouring classes.

"To the active and zealous exertions of one of its members, Mr. Twining, and of Messrs. Michel, Cochin, and De Beausset, members of the "Société d'Economie Charitable" of Paris, is due the practical arrangement of this Exhibition, and I am happy to bear witness of the fact in the name of the President of the Imperial Commission, Prince Napoleon.

"Difficulties of various kinds, and especially want of space, have prevented the Imperial Commission from carrying out fully the principle of this special Exhibition. This explains the delay which has taken place, and the small space which it occupies.

"Let us hope that this Exhibition of cheap articles, such as it is, will contribute to lessen the expenses of small households, and let us also hope that it will be the commencement of more complete, and therefore more useful, Exhibitions of this kind."

The speech was received with marked feelings of sympathy from all present. The party then proceeded to inspect the articles exhibited, after which the Exhibition was thrown open to the public.

With this the Society's visit terminated. The number of members and representatives, with their friends, amounted to about six hundred.

During the Society's visit, the members of the Society's Committee for reporting on the improvements going on in Paris, and others, took the opportunity of personally inspecting the magnificent line of street now in the course of construction leading to the Hotel de Ville, and the vast improvements now being proceeded with in that neighbourhood; a large amount of information connected with this subject has been collected, and will be published shortly in the *Journal*.

In addition to this, several members and others have kindly undertaken to furnish for the *Journal*, notes of such departments of the Exhibition as they are most familiar with. Some appear in the present number.

The Secretary desires to express his great regret that the members should on one occasion have been disappointed at the nonfulfilment of the engagements made for them. The circumstance arose from the Secretary-Ge-

neral of the Prefecture being absent from Paris, and the assistant-secretary, with whom the appointment had been fixed, having left for his vacation without communicating to his colleague the arrangements he had made.

Owing to the arrival of the news of the taking of Sebastopol, and the consequent pressure of State business, no day had been fixed by the Emperor for the reception of the Society's address, which was, therefore, placed by the chairman on his departure from Paris in the hands of his Excellency Lord Cowley, to present on behalf of the Society.

On Thursday evening, the 20th instant, a communication was received by the Chairman from Lord Cowley, stating that the Emperor had granted an audience for the reception of the address on the 23rd instant. The Chairman and the Secretary started on Friday for Paris, and proceeded to arrange among the members in Paris a deputation to present the address. The deputation, consisting of the following members, viz.:—Dr. Booth, F.R.S., Chairman of Council; Lord Ebrington, M.P.; Mr. Henry Cole, C.B., V.P.; Mr. Edwin Chadwick, C.B.; Sir Charles Fox; Dr. Royle, F.R.S., Mr. Chance, of Birmingham; Mr. F. Chance; Mr. Lucy, of Birmingham; Mr. F. Bennoch; Mr. Hollins, President of the Potteries Chamber of Commerce, Mr. Simpson, Mr. Palmer, and the Secretary, proceeded to the Palace of St. Cloud, at two o'clock. Lord Cowley was in attendance, and introduced the members of the deputation, whereupon Dr. Booth presented to his Majesty the following address:—

"SIRE,

"May it Please your Imperial Majesty,

"We the Council and Members of the Society instituted at London in 1754, for the Encouragement of Arts, Manufactures, and Commerce, together with the Representatives of the Literary, Scientific, and Mechanics' Institutions throughout Great Britain and Ireland associated with us, beg leave to approach your Imperial Majesty with sentiments of the most profound respect.

"In accordance with the recommendations of his Royal Highness the Prince Albert, our illustrious President, who founded the Exhibition in 1851, in whose success our Society took a deep interest, we have visited this magnificent city to judge for ourselves of the effects of such displays of industry in accelerating the progress of Arts, Manufactures, and Commerce, as also carefully to inspect those splendid public works which adorn the capital of France, and reflect a lustre on your Majesty's name that will be as lasting as themselves.

"Since our arrival we have regarded with feelings of admiration and delight the manifold features of this Great Exhibition. We rejoice to be enabled to express our decided opinion that the contents of its several compartments afford the most convincing evidence of the marked and rapid progress which has taken place in Arts and Manufactures during the last four years.

"The sublime conception of inviting all nations to contend in friendly rivalry with each other for the promotion of the material welfare of mankind, is fully developed and once more realised in the French Universal Exhibition. This grand display of the vast and varied results of genius and industry assures us that the waste of war will be in some measure compensated, and that beneath the peaceful banners of an onward civilisation the nations of the West will achieve victories not less glorious than those which, under Providence, the justice of their cause and their own enduring bravery have won for their united arms. While the impulse thus given to the cultivation of the arts of peace has multiplied the relations and strengthened the bond of union between France and England, their political alliance, consecrated by the blood of the bravest and noblest of their sons, has ripened into the cordial sympathy of national friendship. That blood has not been shed in vain, for we hold it as our deepest conviction that the solidarity of France and England is

the one sure guarantee for the conservation and advancement of the civilization of the world. And we further believe that they may best promote their mutual prosperity by a freer interchange of the products of *industry*, and consolidate their alliance by uniting their exertions to give a wider development to Arts, Manufactures, and Commerce, whose progress it is the special object of our Society to advance.

"As the faithful and unswerving upholder of that alliance, and the conservator of civilisation, your Majesty receives from us, and from our fellow-countrymen of every class and grade, the spontaneous homage of an unquestioning confidence. We pray your Imperial Majesty graciously to accept this our humble tribute of profound respect and unfeigned admiration.

Given under our Common Seal this eighth day of September, 1855.

JAMES BOOTH, *Chairman of the Council.*
P. LE NEVE FOSTER, *Secretary.*

The Emperor made a gracious reply, thanking the Society and members for the address, and regretting the unavoidable delay which had taken place in its reception, and the inconvenience which, he feared, had been occasioned to the members, and expressing his sense of the kindness which he had received from the English generally. His Majesty then entered into conversation with the members of the deputation, referring more particularly to matters connected with the improvements now going on in Paris, and to questions relating to sewerage and the drainage of towns. The audience lasted nearly half an hour.

The original deputation consisted of Earl Grey, Viscount Ebrington, M.P., General Buckley, M.P., J. Brady, M.P., E. Ball, M.P., W. Ewart, M.P., R. Stephenson, M.P., Sir Charles Fox, E. Chadwick, C.B., H. Cole, C.B., Dr. Booth, F.R.S., J. Glyn, F.R.S., P. Graham, J. C. Macdonald, J. Scott Russell, F.R.S., T. Twining, jun., T. Winkworth, T. Sopwith, F.R.S., the Rev. M. Mitchell, C. Wren Hoskyns, Dr. J. F. Royle, F.R.S., A. Redgrave, E. C. Tufnell, J. Jobson Smith, R. L. Chance, J. G. Appold, F.R.S., J. G. Crace, Dr. Farr, F. S. Cary, J. Scott Smith, W. Lucy, F. Bennoch, W. B. Simpson, M. D. Hollins, P. Palmer, C. F. Audley, F. Chance, with the following representatives nominated by the Institutions:—F. Barker, Bakewell Institute; W. Bide, Yeovil Mutual Improvement Society; Alderman Bramwell, Durham Mechanics' Institution; William Candland, Stoke-upon-Trent Athenæum; J. Cartwright, Loughborough Literary and Philosophical Society; Joshua Clarke, Saffron-Walden Literary and Scientific Institution; J. B. Cooke, Liverpool Chamber of Commerce; Thomas Cox, Cirencester Mechanics' Institution; Cuthbert Curtis, Wellingborough Mechanics' Institution; R. C. C. Dennett, Nottingham Mechanics' Institution; Robert Dawbarn, Wisbeach Mechanics' Institution; Thomas Dawson, Yorkshire Union of Mechanics' Institution; W. Ward Duffield, Chelmsford Mechanics' Institution; Henry Edwards, Lynn Conversazione and Society of Arts; W. G. Everett, M.D., Devizes Literary and Scientific Institution; W. Ewart, M.P., Annan Mechanics' Institution; William Fogerty, Limerick Institution; Benjamin Fothergill, Manchester Mechanics' Institution; D. Francis, Beaumont Institution, Mile-end; G. G. French, Poole Mechanics' Institution; Rev. John Clement Govett, Staines Literary, Scientific, and Mechanics' Institution; Jasper Gripper, Hertford Literary Society; G. Harris, Calne Literary Institution; Edward Heath, Liverpool Mechanics' Institution; Philip Hubbersty, Worksworth Mechanics' Institution; Oliver Ellis Jones, Welchpool Reading Society; William Knott, Oldham Lyceum; C. Langland, Epsom and Ewell Literary and Scientific Institution; Joseph Levi, Jews and General Literary and Scientific Institution; William Mabbell, Coventry Institution; Alexander McIvor, Leeds Mechanics' Institution and Literary Society; W. Marshall, Ely Mechanics' Institution;

Joseph Maugham, Gateshead Mechanics' Institution; Rev. Robert Maugham, Stanhope Literary Society; J. B. Morris, Lewes Mechanics' Institution; David Nicoll, M.D., Royal Institution of South Wales; Charles T. Phillips, Windsor and Eton Literary, Scientific, and Mechanics' Institution; James Poulter, Dover Museum and Philosophical Institution; R. S. Poulton, Maidenhead Literary and Scientific Institution; Moses Provan, Glasgow Athenæum; John Robson, Warrington Museum and Library; Joseph Ridley, Hexham Mechanics' Literary and Scientific Institution; William A. Rogers, Alton Mechanics' Institution; Richard Sharp, Lymington Literary Institution; W. Sparks, Crewkerne Literary and Scientific Institution; Teesdale Stephenson, Durham Washington Chemical Works; R. J. Spiers, Oxford Free Library; William Spooner, Sudbury Museum and Literary Institution; William Sutherland, Croydon Literary and Scientific Institution; Mark Thompson, Newport (Salop) Mechanics' Institution; John Warren, Royston Mechanics' Institution; George Webster, Kings Lynn Stanley Library; Henry Whitfield, Ashford Mechanics' Institution.

* * If any names of representatives have been omitted, the Secretary will feel obliged by their being sent to him for insertion in the next Journal.

PARIS EXHIBITION, 1855.

MINERAL PRODUCTS EXHIBITED.

On Saturday, Sept. 8, Mr. Sopwith, at the request of the Council of the Society of Arts, gave an explanation of the Mineral Products at the east-end of the Annexe, or long gallery.

This building extends for a distance of three-quarters of a mile along the north bank of the river Seine, and is divided into 145 partitions in length, and 4 in width. The numbers lengthways are marked on the pillars, and the letters A, B, C, D, indicate the first, second, third, and fourth divisions of breadth—A, being on the south side of the gallery, next the river. The term "gallery" is here applied to the entire building—including the ground floor as well as the side galleries, which extend on each side along the eastern half of the building.

The numbers commence at the east end of the Annexe, close to the entrance from the Place de la Concorde, and, together with the letters, form an excellent means of reference to any of the objects exhibited. The following numbers and letters indicate the general positions of mineral products, &c.

Nos. 1, 2, 3, 4—A, B, and C.—English Mineral Products.

9 to 13—D.—Minerals, &c., from Canada.

14 to 16—A, D.

44 to 69—A, B, C, D, } Mineral Products of France.

16 to 18—B, C, D.—Ditto Spain and Tuscany.

18 to 19—B.—Ditto Portugal.

19 to 20—B.—Ditto Turkey, Egypt, &c.

20 to 21—B.—Ditto Greece.

18½ to 22—C.—Coal, Sardinia; Models, &c.

24 to 26—D.—Mineral Products from Sweden.

26—A, B.—Ditto Hamburg and Hanseatic Towns.

26 to 41—A, B, C, D.—Ditto Prussia and Austria.

41 to 44—A, B, C, Ditto, Belgium.

The following brief references, from notes made by Mr. Sopwith, may be found useful by those who wish to direct their attention to mining illustrations and mineral products. They commence from the extreme east end of the Annexe, and the prefixed numbers and letters show the vicinity of the several objects:—

1, A.—Lead and Silver from the mines of W. B. Beaumont, Esq., M.P., at Allenheads, in the North of England. Exhibited by Mr. Sopwith, together with specimens of rocks, ores, and geological models.

2, A.—An excellent collection from the Duchy of Cornwall Mines, accompanied by a descriptive manuscript book, and a series of specimens from South Wales, with a vertical section, on which several of the mineral and geological characters of the strata are well delineated.

4, A.—Minerals from Bristol; a good collection of building stones; marble in square blocks, &c. Partly formed in 1851 by Mr. Thomas Howard; exhibited in Crystal Palace 1851, and presented to Bristol Institution, with considerable additions recently made by Mr. Etheridge.

4, A. Specimens of coal and ironstone from Dowlais Iron Works; varieties of clay from Dorsetshire and Cornwall; specimens of peat in various stages of compression, and a great variety of coal specimens, 272 in number, from different parts of Great Britain. A good collection of specimens of coal, &c., from the Department of Science and Art in Ireland. Large specimens of coke from Marley Hill and Garesfield, with analysis by Dr. Richardson.

3, B.—Examples from Shelton Bar Works; a good section of strata and several instructive specimens; anthracite from Llanelly; copper ores in various stages of preparation; a great number of minerals from South Wales and Ireland; an excellent collection of minerals from Cornwall, many beautiful examples; a large specimen of copper ore from the Devonshire Mines; a collection of coals from Sunderland (extremely well arranged); a section of Jarro Colliery, showing the dislocations of strata in a coal mine; magnesian limestone; collection of safety lamps; steel mills, &c.

1, 2, 3, 4, B and C.—Illustrations of iron; long railway bars, &c.; chairs and highly-ornamented products of iron. (At 34 B are also several examples of long iron rails.)

9 to 13, D.—Mineral Products from Canada; excellent examples of building stone and other useful materials, well arranged and displayed; a model of the Brock Monument is composed of the same building stone as the original; a great variety of marbles, agates, lithographic stones, ironstone, native gold, silver, copper, slate. The Canadian collection is very complete and instructive.

15, A.—Several good specimens of modelling in this place are worthy of close observation, as are some maps showing the value of different scales; models of geometric forms and rocks, the latter useful for landscape painters, who often err in the geological character of rocks.

15, D.—Geological map of the department of Calais; the system of colours employed is clear and expressive.

14, D.—Interesting map of *minerals* in France, showing the extent and position of mining districts.

16, B.—Coals and other minerals in great variety from Spain; marbles, iron, copper, coke, good examples of lead, silver, antimony, charcoal, salt, &c.

16, C.—Tuscany. A collection of about 1,500 minerals and fossils, iron pyrites, iron ores, galena, marble and building stones, well shown.

18 to 19, B.—Minerals from Portugal, lead, copper, coal, &c.

19, 20, B.—Turkey, Tunis, Egypt. A few mineral products, and good fossil fish.

20, B.—Greece. Emery, magnesia, millstones, an excellent variety of marbles and lithographic stones.

18½.—Sardinia. Large block of coal.

21, 22, B, C.—Switzerland. Maps and models, terra cotta fort. At 21 D, in upper gallery, a number of excellent mineral specimens from Norway.

25, D.—Sweden. Excellent specimens of lead, slate, peat, litharge, ironstone, copper; good specimens of iron ores, plans of furnaces, models of water wheels,

- several mining models, crushing mills, rolling mills, products of iron, fine castings.
- 26 to 41, A, B, C, D.—This part of the gallery is extremely rich in mining illustrations.
- 26 to 27, C, D.—Coal and coke from Saxony; forty-one specimens of stone, in square blocks, extremely well arranged; minerals from Bavaria and Westphalia, well arranged.
- Opposite 32, and ranging from 28 to 35, a great variety of minerals, especially iron ores.
- 32, B.—Large geological map of Rhenish Prussia, with several excellent mining maps and sections. An immense mass of coal. Abundant illustrations of black band and other ironstones.
- 39, B.—A fine specimen of galena from Holzappel; sections of mines, with drawing of St. Stephen's Church in Vienna, as a scale of comparative size.
- 41, A, B, C, D.—Coal, marble, copper in great abundance.
- 42 to 44, C.—Belgium. Minerals, lead, iron, &c. Dumont's maps of Belgium and Europe, at 44, C, are deserving of close study, as illustrations of geological mapping and colouring. Several of the sections of the Belgian coal-fields are extremely curious. Immense blocks of coal, and a great variety of mineral products from Veille Montagne works.
- From 44 to the middle of the long gallery is occupied by mineral and other products of France, many of which are on a scale of great extent, and of a most valuable and instructive character.
- 53 to 59, A, B, C, D.—A good collection of minerals from Avignon, extremely well arranged; a great variety of marbles, extending from 57 to 59 C; slates, large iron plates, and rails.
- 55 to 65, A.—A great number and variety of mineral products; specimens of lead ores and lead; some good plans and sections of mines; gold from California; a large cake of silver from the lead mines of Pontgibaud, with processes of lead washing, &c., well illustrated. A great many examples of coal from different parts of France, some of great magnitude. At 65 C is a very large and curious model of the coal mines of the company D'Anzin, showing the men at work and the methods of extraction. Near it are several mining models, cages for descending and ascending shafts, &c.
- 67 to 69, C.—A most interesting series of examples of the products of Algeria, amongst which the minerals are especially worthy of notice, and apparently indicate considerable resources in that important feature of national wealth. The specimens of galena, marbles, &c., are very fine, and a cake of silver, value £2080, accompany the lead specimens from the mines of Le Calle. There is here also a very illustrative drawing on a large scale of the exterior of the mines.

The preceding notes are confined to the eastern half of the Annexe, or long gallery, in which the mineral products of the Exhibition are for the most part concentrated, so much so as to render it by far the most comprehensive school of general study which has ever been formed for the instruction of the miner and mineralogist. But in various other parts of the Exhibition are examples of machinery, models, maps, &c., which form a continuation of this department of study so extensive, and at the same time so clear and self-explanatory, that it is much to be wished that a large proportion of them could be permanently rearranged, as a mining and mineral collection, after the close of the Exhibition, and that upon a scale commensurate with the importance of the subject, for it must be kept in mind that mineral treasures are in every nation the very basis of manufacturing and commercial prosperity. In the gallery of communication leading from the Annexe to the Palace of Industry, is a fine collection of minerals and fossils from Turin; and in the south and east galleries

of the Palace itself, the spectator can scarcely avoid noting the large and conspicuous geological and engineering maps, as, for example, the geological map of England and Wales, Griffiths' geological map of Ireland, Ordnance maps of Great Britain, and Knipe's useful compendium of the geology of Great Britain and Ireland. These, in connection with the mineral illustrations sent from other nations, which are placed in various parts of the Exhibition buildings, are so numerous as to be with difficulty grouped in any brief notice like the present. The Australian collections, at the east end of the Palace of Industry, are very complete, and show the remarkable varieties of gold found in different districts. Altogether the mineral kingdom is richly illustrated in the Paris Exhibition, and if the several collections which are now scattered over different parts of the Exhibition, and intermixed with other objects, were brought into one continuous, well-arranged series, they would undoubtedly constitute a more important and instructive mining school and museum than has ever yet been formed.

PARIS EXHIBITION 1855.

PRODUCTS EXHIBITED BY THE COLONY OF NEW SOUTH WALES.

During the Society's visit, Mr. Macarthur, one of the Commissioners appointed to represent the Colony of New South Wales, at the request of the Council explained to the Members the products of this colony, and the following notes have been kindly furnished by that gentleman for the *Journal* :—

The products of the colony of New South Wales are separated, part of them being exposed in the gallery of the Annexe, adjoining the productions of other British colonies; the remainder, comprising the most valuable and probably the most interesting objects, being, for want of room in that quarter, displayed in the Palais de l'Industrie itself, at the top of the staircase, adjoining the East India Company's department, in the British portion of the gallery. Some pains and expense have been devoted towards the arrangement of the objects in this little detached quarter. The cases, which are of very elegant design and good execution, have been made at Paris, wholly of woods indigenous to the colony, which were brought to Europe as part of the collection of the woods mentioned below. There are, besides, some tables and other articles of decorative furniture which serve to show the fitness of the Australian woods for the purposes of ornament, many of them, it is stated, being now for the first time so employed.

GOLD.

Amongst the contents of the cases may be specified a complete collection of specimens of gold, of considerable intrinsic value, representing the produce of a great number of different gold fields, accompanied by specimens of the respective auriferous earths, or "washing stuffs," and their superincumbent strata. These specimens exhibit a remarkable variety in the colour, form, and size of the grains, the produce of no two distinct fields being alike. More than fifty fields or "diggings" are said to be here represented. This fine collection has been made at the expense of the Colonial Government, and will be sold at the close of the Exhibition.

MINERALS, &c.

The collection of minerals exhibited by the Rev. W. B. Clarke, of Sydney, next claims attention; it comprises more than 400 specimens, arranged systematically, beginning with the newest formations and terminating with the mountain limestones, granites, &c., of the older series, and forms a complete illustration of the geology of that distant portion of the globe. Many very interesting fossil remains are comprised in this fine collection, comprising impressions of heterocercal fish, bones of the diprotodon, &c., &c.

Secondary to this collection, giving a general idea of the whole formation of the eastern part of Australia, are several other sets of specimens more in detail, to illustrate particular portions of it; such, for instance, are the collections sent by the Rev. C. P. Wilton, of specimens of coal and the various coal measures, with fine impressions of ferns, &c., from the coal district of Newcastle (New South Wales), 60 miles north of Sydney, that sent by Mr. W. Keene, examiner of coal fields to the Government of New South Wales, comprising specimens from the Bullai and Wollongong coal field, 40 miles south of Sydney (the seams in both these localities cropping out on the line of coast cliffs), as well as the very complete collection of specimens of rocks in connection with the auriferous district on the Peel River Company's estate, made by Mr. Fr. Odernheimer. Besides these there are magnificent specimens of copper ore, from various lodes worked in the interior, with ingots of remarkably pure copper produced from them. An interesting set of specimens is contained in a separate case, the produce of a singular field of iron called the Fitz-Roy Iron Mine, the metal being exhibited in every state of manufacture. It is stated to yield 70 per cent. of iron, to exist in inexhaustible abundance, and to possess remarkable qualities, the ore having apparently been forced up by subterranean agency in huge masses, through beds of coal; specimens of the latter are exhibited with the iron. Fine marbles, granites, native sulphate of magnesia, and sulphate of alumina, with gems, argenti-ferous galena, and molybdenum, besides specimens of coal from various fields more than 400 miles apart, impart additional interest to this branch of the New South Wales contributions.

WOODS.

There are two fine collections of specimens of woods indigenous to the colony, made at the expense of the New South Wales Commission, which are chiefly exhibited in the Annexe. The first of these, made by Mr. Macarthur, comprises more than 240 specimens of distinct species from the districts near Sydney, with their systematic names as far as these could be ascertained, their aboriginal and local names, their average dimensions and the uses to which they are supposed to be applicable. It has already been stated that many fine ornamental woods unknown in Europe, have been selected from them, and successfully applied in the manufacture of furniture, &c., which is exhibited. A selected set of specimens from the hard durable carpentry woods of the collection is at the present time being subjected to a series of experiments to test their strength, flexibility, &c.; these experiments are conducted in the machinery department of the Annexe, under the intelligent superintendence of Captain Fowke, R.E., Secretary to the British section of the Exhibition. The result holds out the expectation that a number of excellent hard woods, of high colonial reputation for durability, may be added to the list of those on *Lloyd's List*, applicable to ships of class A 1; a subject of the greater moment, particularly to the shipping interest, since supplies of African oak are stated to have already become difficult to obtain. The sea board of New South Wales and of Western Australia, and portions of the Island of Van Diemen's Land, promise to afford immense quantities of these noble species of timber trees. The second collection, comprising 90 specimens, was collected by Mr. Charles Moore, Director of the Botanic Gardens, Sydney, from the northern districts of New South Wales, between lat. 26° and 28° S., and comprises many fine and interesting specimens of wood. It is stated that both collections might have been greatly increased had there been more time, or greater facilities in obtaining labour.

ALIMENTARY SUBSTANCES.

WINES.

Amongst the alimentary substances there are more than a dozen distinct samples of wines exhibited, the whole of which are understood to have been favourably classed by

the jury of experts called in to assist the Jury of Class II., and some of them are stated to possess remarkable excellence. This branch of industry is of considerable interest to the mother country. As is most frequently the case on their first introduction with manufactures or agricultural products requiring specific knowledge of the subject and much experience, this article, although originated in the colony more than 30 years since, has hitherto struggled on without making any rapid extension; various local difficulties are stated to have occurred for a time, arising chiefly from want of experience in the proprietors, and a deficiency of the labour adapted to the pursuit. These having, to a considerable extent, been overcome, another obstacle, in the want of a market for wines of colonial growth, is stated to exist. The extensive importation of European wines into the colony, amounting to more than 750,000 gallons in 1853, valued at £198,000, interferes with it. Unless the vineyard proprietors of the colony could hold out the expectation of affording to the merchants an equivalent for this extensive importation, in wine to export, it seems clear that it is the interest of the latter to check, or at all events to afford no facilities for, the consumption of the Colonial wine at home, inasmuch as it would interfere with their import trade. This is stated to have been the case. The high character given at Paris to the products of these infant vineyards is therefore of the utmost importance to them; it will probably cause a demand for the wine in Europe, and a rapid increase in its production, reconciling the hitherto antagonistic interests of the merchant and the wine-grower.

As far as information has been secured, it appears that these wines can probably be supplied, duty paid, in London at 24s. to 30s. per dozen.

WHEAT AND MAIZE.

The wheats exhibited are of great excellence, and some of the samples are amongst the heaviest, if not actually the heaviest, of the numerous specimens exhibited throughout the Exposition. The same high character applies to the specimens of maize, some of the cobs or ears of which are of unusually large size, and the corn of the very best quality. The produce is variously stated, according to the varieties, at from 50 to 80 bushels per acre.

BEEF, BISCUITS, &c.

Some fine specimens of salt beef in the tierce are exhibited, and meat in tins, preserved fresh, the quality of which is much praised in the colony; but these, it is said, have not hitherto been examined at Paris. These supplies can be afforded in the colony at a lower rate than provisions of similar quality produced in Europe. It is of importance to shipowners to know that they can be obtained in the colony. The ship and other biscuits exhibited are also of excellent quality, and are stated to be extensively manufactured at Sydney by the aid of steam machinery.

WOOL.

The samples of wool exhibited seem to indicate that the exhibitors at least have endeavoured to maintain the reputation of the colony for this, its most important export. There are samples from several flocks in the collection; amongst them a bale, the produce of Mr. E. Cox, from which have been manufactured in France, shawls, satiné de laines, superfine cloths, some of great beauty, which are exhibited; and four samples from the original Merino flock created by the late Mr. John Macarthur, the founder of this branch of industry in the colony. These last are said to have been exceedingly admired by the French experts and manufacturers called in to assist the jury, as possessing the peculiar good qualities which characterise the Australian type, combined with the true Merino character in high perfection.

There are some beautiful specimens of cotton, almost wholly of the long-stapled or Sea Island variety; these are stated to have been produced at Moreton Bay, but from information received it appears that, following the sea-board

of New South Wales from lat. 36° northerly to within the tropics, and in the northern districts to a great distance inland, innumerable extensive tracts of country exist, possessing every requisite for the production of this valuable staple in high perfection. Hitherto, little or no attention to this subject has been paid by the colonists, their time having been devoted to other profitable pursuits; the scarcity of labour combined with want of information has operated to prevent any extensive cultivation of cotton. The former difficulty might be overcome by importing into the northern settlements labour from Bengal; unfortunately the regulations of the East India Company forbid this importation. These regulations having been suspended or relaxed in favour of the Mauritius and the West India Colonies, there seems to be no reason why they should be maintained with reference to those in Australia, where the climate would be not less suitable to the natives of India, and where their condition would, for many years to come, be much superior to that which they obtain elsewhere. The greatest vigilance is exercised by the colonial authorities to protect emigrant labourers of every description from being imposed upon, so that oppression of any kind, under the colonial regulations with respect to emigrants, is stated to be impracticable. A vast territory of virgin soil, waiting only the labour of man to bring it into a state of active production, exists on the one hand, possessing vast supplies of food which are annually wasted; and not very distant from it we see another portion of our empire teeming with people, frequently reduced to a state of distress for want of food, who would willingly emigrate to the former if they knew the improved condition which would there await them. Why should any regulations of the Government interpose to prevent this desirable intercourse from being effected through the instrumentality of the community willing to bear the cost?

It may be added, from competent colonial authorities, that rivers exist along the eastern coast within the latitudes favourable to the growth of cotton, which possess navigable waters, already explored to the extent, collectively, of from 500 to 1,000 miles, nearly the whole of which is bounded by lands favourable to the production of cotton.

Numerous other objects meet the view in the New South Wales collection, of considerable interest, as affording hopes of future advantageous production. In the Fine Arts, however, there is little to notice, except a beautiful medal, struck in London, from dies by Mr. Leonard C. Wyon, after designs by two colonial artists, and three statuettes, two of them in gold, representing the "digger" in characteristic costume at his toilsome trade, and the other, in silver and gold, of an aboriginal savage in pursuit of his game, all executed by a colonial artist, with great truth and considerable merit.

ON A NEW PROCESS OF OBTAINING AND PURIFYING GLYCERINE.

By GEO. FERGUSSON WILSON, ESQ., F.R.S.

Part of this Paper was read at the Glasgow Meeting of the British Association for the Advancement of Science, Sept. 1855.

The paper I was asked to give was one on our new processes of obtaining and of purifying glycerine. I trust, however, you will excuse, as an introduction, a short sketch of the past history of glycerine and its uses, though it will take us over some ground well known to most members present.

Glycerine was discovered in 1789, by Scheele, as a product in the process of lead plaister making, and was called by him the sweet principle of oils. About twenty-five years afterwards it was studied by the father of fatty chemistry, Chevreul, and shown by him to be the base of fats and fat oils. M. Chevreul lately received a specimen of glycerine obtained by our new process, with expressions of extreme pleasure. Nearly half a century has

passed since the earliest of those beautiful researches into the constitution of fatty bodies in the course of which he discovered the function of glycerine, yet our specimen found him still lecturing to his class.

A source of impure glycerine has long existed in the preparation of lead plaister, in which the combination of the litharge with the acids of the olive oil sets the glycerine free; another source in soap-making, the soda or potash setting free the glycerine; and a third source in the stearic candle manufacture, where the lime saponification separates the glycerine. Most of the purifiers of glycerine appear to have preferred this last source.

Notwithstanding the known existence of these great sources of impure glycerine, it was long before glycerine was in any way utilised: hundreds of tons have been and are yearly thrown away.

The first suggestion of a use which we can trace dates in the beginning of 1844, when Mr. Thomas De la Rue, being engaged on some experiments requiring the use of syrupy substances, procured some glycerine from Mr. Warrington, of Apothecaries' Hall, some of which he applied to a burn and an irritation of the skin. The experience thus obtained of its properties of soothing and keeping moist, led to its introduction, through Mr. Starlin, into the Hospital for Skin Diseases, where it soon came into extensive use.

In 1846 Mr. Warrington took out a patent for the use of glycerine as an agent in preserving animal and vegetable substances, and tried many experiments on preserving meat. He informs me that part of a neck of mutton preserved in glycerine for several months, when cooked by Soyer, was partaken of by a gentleman with great satisfaction.

Mr. Warrington, I believe, first applied glycerine in mounting objects for the microscope, for which it has proved so successful.

In the *Lancet* of June 1849, Mr. Thomas Wakley published the results of a year's experience in a long and very interesting paper on the Use of Glycerine in Diseases of the Ear, giving a number of cases in which it had proved a cure for deafness. In the number of the 23rd of the same month, his results were confirmed by letters from Mr. Erasmus Wilson and Dr. Gardner, the latter of whom drew attention to the fact that the glycerine should be free not only from any trace of lead, but also as much as possible from water. His theory was, however, better than his practice, for the glycerine he speaks of using, s. g. 1.280, being above the density of anhydrous glycerine, must have been impure.

Isolated applications of glycerine had thus been suggested, but M. Cap appears to have been the first to see its extraordinary value in a great variety of medicinal preparations. His very valuable and interesting papers were published in the *Annales de Pharmacie et de Chimie*, and translated into the *Chemist*. I shall give two short extracts from them.

M. Cap in his first paper (*Journal de Pharmacie et de Chimie*, February 1844, *Chemist*, April, 1854,) begins by attacking the process of purifying glycerine given in the French chemical books, and shows its defects. He then gives his own process, remarks upon the great value of glycerine in skin diseases, and after suggesting a number of valuable uses, proceeds as follows:—

"Glycerine dissolves the vegetable acids, the deliquescent salts, the sulphates of potassa, soda, and copper, the nitrates of potassa and silver, the alkaline chlorides, potassa, soda, baryta, strontia, bromine, iodine, and even oxide of lead. It dissolves or suspends the vegetable alkaloids in the same manner as the aqueous liquids, and at the same time the resulting products may be used for the same purposes as though mixed with oil. Thus the salts of morphia dissolve in it completely, even cold, in all proportions. Sulphate of quinine, in the proportion of 1/50, dissolves in it when hot, but when cold separates into clots, which when triturated with the supernatant liquid give it the consistence of a cerate very useful for frictions

and embrocations. It is the same with the salts of brucine, strychnine, veratrine, and most preparations of the same order, which enables us to consider that we have now if not medicinal oils with a vegetable alkaloid base, at least a series of new preparations which will fulfil a perfectly analogous use in therapeutics."

M. Cap, in his second paper (*Chemist*, Oct. 1854), states that he employed glycerine of 28 Beaumé, or containing 88 per cent. of anhydrous glycerine, and speaks of it as a solvent of sulphuret of potassium, and sulphuret of lime, of iodine, iodide of sulphur, iodide of potassium, iodide of mercury, of some chlorides, and of quinine, and sulphate of quinine.

In the *Chemist* of February, 1855, Dr. Crawcour, of New Orleans, states that for twelve months past he had been in the habit of using glycerine very extensively in those cases requiring cod liver oil, in which the nauseous taste of the latter medicine rendered its exhibition impossible, and that now, in his practice, it had entirely superseded cod liver oil.

In a paper read at the meeting of the Royal Institution of the 30th of March, 1855, by the Rev. John Barlow, F.R.S., attention was again drawn to the great preservative power of glycerine upon meat. On this occasion Mr. Barlow showed specimens of flesh which had been immersed, some partially and some wholly in glycerine, for more than a month. I can answer for the flesh having appeared to be perfectly fresh.

M. Cap worked upon the waste liquors of soap and stearic candle works, which liquors he had first to concentrate. His process was shortly this:—he used sulphuric acid to separate the lime, and continued boiling and agitation to drive off the volatile fat acids, removing any excess of sulphuric acid by means of carbonate of lime, allowing the liquor to cool at different densities, so as to deposit sulphate of lime, and, after final concentration, treating and filtering with washed animal charcoal.

M. Cap's process, though an undoubted improvement, was not perfect, as glycerine so purified is always liable to contain more or less of salts of lime. And some glycerine, purified in our laboratory, according to M. Cap's directions, contained, in addition, volatile fat acids; and though the process was known in this country, specimens of the so-called "pure" glycerine, obtained from the best sources in London so recently as last January, contained in every case more or less impurity.

The best specimen came from Edinburgh, but even this was not absolutely free from impurity. Some medical men appear to have been afraid to prescribe glycerine for internal use, sometimes with reason, as appears from the *Chemist* of May 1855, when Mr. Hamilton, of Liverpool, referring to the papers of MM. Cap and Garot, and of Dr. Crawcour, stated, that no doubt the glycerine purified and used by them might be safely used internally, but that having doubts about the purity of the glycerine commonly sold as "pure glycerine," he had procured samples from several of the most respectable chemists in Liverpool, and on examination, had detected lead in considerable quantity, and that the specimen in which he detected the largest quantity of lead was labelled "pure glycerine," was sold at double the price of the common glycerine, and was warranted free from lead.

I will now proceed to describe the new process for obtaining and purifying glycerine, and may remark that the road by which we arrived at pure glycerine was a rather circuitous one. Our first step was to do away with the lime process of saponification, and with it our only source of impure glycerine. By our first improvement in separating the fat acids from neutral fats, the glycerine was decomposed by the direct action of concentrated sulphuric acid at a high temperature, and all that remained of it was a charred precipitate. A new process for decomposing neutral fats by water under great pressure coming under our notice, led us to look again more closely into our old distilling processes, and the doing this showed, what we

had often been on the brink of discovering, that glycerine might be distilled.

In our new process the only chemical agents employed for decomposing the neutral fat, and separating its glycerine, are steam and heat; and the only agents used in purifying the glycerine thus obtained are heat and steam,—thus all trouble from earthy salts or lead is escaped.

Distillation, however, purifies the impure glycerine of the old sources.

On the table is a series of products of palm oil, which will serve to illustrate the process. Steam, at a temperature of from 550° to 600° Fah., is introduced into a distillery apparatus containing a quantity of palm oil. The fatty acids take up their equivalents of water, and the glycerine takes up its equivalent; they then distil over together. In the receiver the condensed glycerine, from its higher specific gravity, sinks below the fat acids. Sufficient steam must be supplied, and the temperature regulated, otherwise the elements of the glycerine do not take up their equivalent of water, and acroleine is evolved—a body of a very different character, an acrid eye-inflaming vapour, appreciated only by those who have had the misfortune of an experimental acquaintance with it.

In an ordinary apparatus the glycerine distilled from the neutral fat is not in a sufficiently concentrated state for most purposes; it should, therefore, be concentrated, and, if discoloured, be redistilled. It is then obtained, in the state of the specimen on the table, at the temperature of 60° Fah.; it is of s.g. 1.240, and contains 94 per cent. of anhydrous glycerine. It can be concentrated to s.g. 1.260, or to contain 98 per cent.

I have now to mention some uses for glycerine which I believe to be new, or to which I have seen distilled glycerine applied.

A possible use which appears worthy of experiment is to inject it into the bladder, for the purpose of dissolving calculous deposits; from its blandness it should not cause irritation, while, as it is a solvent of urea and phosphate of lime, it might dissolve them when in the bladder. Some of the high authorities have received glycerine for the purpose of the experiment.

The use of glycerine in photography having been suggested, some distilled glycerine has been sent to several of the best photographers and makers of photographic preparations. It was very well received, and considered to promise well, and is still the subject of many experiments, but as yet it does not appear that any great results have been arrived at. It is, however, expected to supersede the honey of Shadbolt's process.

The properties of soothing and keeping moist the skin have caused it to be used upon chapped hands and sunburnt faces. It has been proposed as a substitute for syrup in preserving fruits. Mixed with alcohol or per-oxylie spirit, it has been proposed by Mr. Warren De la Rue as an economical fuel for spirit lamps.

For some time past, in Edinburgh as in London, it has been used in skin diseases; it is now being tried in some cases of diseases of the mucous membrane of the stomach.

We have been informed that in the preparation of several medicines glycerine may be substituted for syrup or sugar, with the effect not only of preserving the medicine in an active state and free from change, but also of very greatly improving its taste. Griffiths' iron mixture has been mentioned to us as an instance of this.

Glycerine appears to give the means of preservation of some objects of natural history without change in their colour. This is shown by the specimens of fish upon the table. Our first experiment was upon a brilliantly-coloured two-pound trout, caught in one of the Perthshire lochs. Immediately on taking it from the water I poured a quantity of glycerine over it, and wrapped it in a cloth. At night the fish was cleaned and immersed in glycerine. Next day it was again wrapped in a saturated cloth. On examining it a day or two afterwards in Edinburgh the colour on the scales was unchanged. When it arrived in

London, part was steeped in water and then cooked. Though perfectly fresh and firm, it had lost almost all its flavour. The uncooked portion was immersed in glycerine, and sent to Professor Owen, who suggested that the brilliantly-tinted fishes of the Coral Islands and tropical coasts might be brought home in kegs of glycerine.

On the table are specimens of trout, roach, and perch, which have been, the trout more than two months, the perch and roach more than one month, in their bottles. It will be seen that the colours continue bright.

I may now state in conclusion, that though a variety of uses, actual and possible, for pure glycerine have been mentioned, yet when we consider its power as a solvent, and at the same time its blandness, and freedom from all irritant, exciting, acid, and fermenting properties, we must feel that not a tithe of its uses have yet been developed; that in glycerine there is a wide field open, requiring many scientific and practical labourers, and which, once fully worked, will yield a tenfold crop of uses. Pure glycerine will then take its proper place among the most valued of modern products; and, produced, as it will be, in great quantities, it will be recognised in the arts as well as in medicine as a new real blessing to mankind.

Home Correspondence.

DECIMAL COINAGE.

SIR,—In the separate copies of the List of Books and Pamphlets on the Decimal question, instead of the usual short titles, there occurs the following statement:—

"Rathbone, Theo. W.: Letter of the 19th August, 1853, in the *Athenæum*, containing the First Sketch of a Plan for introducing, with no compulsory change but that of the tenpence for the twelvecence, as one of our moneys of account, and a silver coin corresponding in amount of pure silver with the franc to represent this tenpence (the 24th of the pound sterling in value), an absolutely Perfect Practical System of Decimal Accounts in this Country, and an International Silver Coinage with France and all European countries using the franc,—easily extended to the florin or double franc, and the dollar or five franc, decimal system of Europe and America. B."

I do not know on what authority this statement was inserted—it was not in the proofs transmitted to me, and unfortunately it is incorrect in almost every particular, viz., the date, the contents of the letter, and the class to which it ought to be referred, and as I fear it may mislead some persons interested in the progress of the question, I send you the following observations:

"T. W. R.'s" letter is not dated; it was published in the *Athenæum* of the 3rd of September, 1853. It may be thus condensed. After complaining of the committee's scheme and praising the French system, which he regards as a universal monetary system, wishing it to be not only introduced here but to the United States, he then proposes, "In this country, for instance, in place of the half-dozen new mil coins, wholly without correspondence with anything now in existence, proposed by the committee, and the banishment of all the old figures but the pound sterling from our accounts, we should have little to do but to substitute an issue of francs for our shilling, to stamp our sovereign with the number 25,* our crown with 6, and our half-crown as 3 franc pieces, and we might still keep our accounts in pounds, francs, and pence (or double sous), instead of our present pound, shillings, and pence."

In the P.S. after reading my letter in the *Times* of Tuesday last, he proceeds—"I would just observe that the great conclusion at which this writer (that letter)

arrives, viz., 'that no decimal system of coinage will be just and practicable which does not retain the penny as one of its essential elements,' is entirely in harmony with the scheme which I have proposed. Both in our coinage and as a denomination in our accounts, the penny or two-sou piece, the tenth of the franc or livre, (*the unit is far the most widely extended and perfect decimal system in existence*), would retain the position claimed for it, on grounds it appears to me altogether irresistible."

It is clear that T. W. R. in this letter recommends, like a correspondent of the *Times* in 1816, and more lately Mr. James Yates, at the Institute of Civil Engineers, the introduction of the present French coinage in all its details, only with a sovereign of 25 for a Napoleon of 20 francs. That when he speaks of the penny, he intends as he generally also designates it, the *two-sous* piece of France, and not our present penny, or he could not have overlooked that though the sovereign contains (about) 250 two-sou pieces, it only contains 240 English pence. Under such circumstances it should have been marked C, like Mr. Yates's essay, and classed with "other plans."

I suspect that the paragraph added to the reference to the letter should have been appended to the next work, in which Mr. Rathbone, having changed his views, there recommended the tenpenny plan as now usually understood, only urging the retention of the pound as a coin of account, which is incompatible with its true decimal character.

I am, yours, &c.,

JOHN EDWARD GRAY.

20th September, 1855.

INTERNATIONAL STATISTICAL CONGRESS AT PARIS.

To the President and Council of the Liverpool Chamber of Commerce.

GENTLEMEN,—In conformity with your letter of instructions, I had the honour of attending as delegate from your Chamber (as well as from the Edinburgh Chamber of Commerce, and Society for Promoting an International Code of Commercial Law) the International Statistical Congress held at Paris on the 10th inst., and beg now to lay before you the report of the proceedings.

The International Statistical Congress held its first meeting in Brussels, in 1853, the object in view being to introduce unity and uniformity in the statistical documents of different countries. The Congress being chiefly composed of members directing the statistical departments of public administrations, it was contemplated to arrive at an agreement whereby the items of information to be collected, the times when the statistics or census of population should be taken, and the form in which the statistical documents should be drawn out, shall correspond, and be as much as possible alike in all countries, for the purpose of easy reference and comparison.

The Paris Congress was attended by official deputies and other statisticians from the United Kingdom, Austria, Baden, Bavaria, Belgium, Costa Rica, Denmark, France, Frankfort, Greece, Hamburg, Hanover, Hesse, Mecklenburgh, Norway, the Netherlands, Parma, Peru, Portugal, Prussia, Saxony, Sardinia, Spain, Sweden, Switzerland, Tuscany, the Two Sicilies, the United States, and Wurtemberg. The Minister of Agriculture, Commerce, and Public Works of France presided over all the sittings of the Congress, which met at the Corps Legislatif for six days, and the members of the Congress were honoured by a reception by the Emperor, at the Palace of the Tuileries.

The first Congress, held at Brussels, dealt with the questions of Population, Territory, and National Survey, Emigration, Agricultural Statistics, Industrial Statistics, Commercial Statistics, Navigation, Economical Budgets, Statistics of Pauperism, Educational and Criminal Statistics. The present Congress endeavoured to establish a system of statistics relating to Means of Communication, Agricultural Statistics (not completed at the first meeting

* This number cannot be a mere error of the press, as it is repeated several times over in different forms in the letter.

at Brussels), Penitential Establishments, or prison discipline, Judicial Statistics, Provident Institutions, Statistics of Accidents, of Insanity, of Epidemics, and of Great Cities, and other important questions connected with medical science.

Without extending on the first subject, respecting the means of communication, which comprises roads, bridges, railways, natural and artificial navigation, harbours, light-houses, telegraphs, &c., I shall pass to Agricultural statistics, the collection of which has been repeatedly urged in this country. This question attracted considerable attention, and both at the meeting of the Section (the Congress being divided into sections, for the better consideration of the various subjects), and at those of the Congress, the discussion was very animated. The first point was—By whose instrumentality shall such statistics be collected? Shall the agents be salaried or not? In other words, as applied to this country, shall the operation be entrusted to the Poor Law Board, or other public bodies or societies, or to paid inspectors? The Congress decided in favour of the latter, except in cases where non-salaried commissions may be safely and conveniently formed. As to the method for obtaining such statistics, it was decided that, first of all, the Governments should obtain a good topographical survey; where that exists, it should serve as the basis of, and control upon, the agricultural statistics; where no survey has been made, care should be taken to obtain local guarantees for the utmost correctness. The statistics of the acreage laid out in different crops should be taken in May or June; those of the crops soon after the harvest, the statistics of cattle in December. Besides the annual collection of the statistics of the acreage and crops, decennial statistics were suggested for a fuller and more detailed account of the state and progress of agriculture. I have laid before the Congress the Report of the Committee of the House of Lords on Agricultural Statistics, and also the Reports of Agricultural Statistics in Scotland, Ireland, &c., &c.

On the subject of judicial statistics, both as regards civil and commercial justice, some important recommendations were made. The law of imprisonment for debt has created much interest in the Continent, and it was decided to inquire into its working by indicating in the statistics the ages and sexes of the persons imprisoned, the nature of the debt, the profession of the debtor and creditor, the duration of the detention, and the causes of the liberation. It was also suggested to form a better classification of the number of judgments given by each group of tribunals, their organisation, and their competence, the amount of notarial acts, according to their different nature, the number of contracts under seal, and of judicial sales, the number of partnerships according to their legal character, the consumption of stamped papers according to the tariff, and the amount of bills of exchange and other negotiable titles.

Bankruptcy statistics, of which there is a complete want in the United Kingdom, formed part of the inquiry. With respect to these, besides the description of the trade, it is important to know the comparative solvency of individual or private traders, commandite partnerships, general partnerships or public companies, &c., &c. No such distinction was hitherto made on the personality of the bankrupt, and I suggested its introduction. Another addition was made in bankruptcy statistics, viz., the immediate or proximate causes of bankruptcy, whether brought about by misfortune, by ignorance, by speculative adventures, or by operations beyond the range of the ordinary trading, or by waste or gambling.

The subject of assimilating the commercial laws of different countries was seriously discussed, and it was decided that it would be of much utility in the interest of statistics, of international commerce as well as for the benefit of individuals, to establish, as much as possible, uniformity in the law and usages which govern commerce, and especially in the facts and acts which are of the same

nature in all countries, such as bills of exchange, partnerships, bankruptcies, &c. The report on the subject, after having described the advantages of the study of comparative jurisprudence eloquently stated,—“A day will come when all legislations shall be submitted to, or shall be compared in their theories, by the jurists, and controlled in their results by the statisticians. Then a new light will be afforded to all nations, which will enable them to appreciate the merits or imperfections of their legislators. Then we shall obtain uniformity in the commercial laws of nations, the necessity of which will be felt every day more by the multiplicity of relations between people and people, the rapidity of the exchanges, and the importance of international transactions. This uniformity of legislation has been early prepared by the Roman law; now we feel the want of it, and it will be a great glory to have prepared it for the future. The civilized world has tended for eighteen centuries towards the same moral law—that written by God himself in the Gospel. Let us pursue this great and fruitful universality, which will by degrees efface all differences, create uniformity in all laws, and leave but one balance in the hands of justice.”

Considerable importance was attached to the forming of statistical departments in all countries to superintend and to systematize the statistics of all the branches of the public service, a subject already strongly recommended by the Brussels Congress. In this country such a department is especially needed, that originally founded by Mr. Porter of the Board of Trade, and now ably directed by Mr. Fonblanque, being very limited in its functions. When we consider the irregularity which exists in the publication of statistical documents, the imperfect form in which they often appear, merely as appendices to otherwise highly important reports, and the want of system in all such publications, which renders them often the ready tools of political parties, it will be admitted that a great national good will be derived from the creation of a complete statistical department. The report on the subject described the state of statistic administration as follows: “Many statistics are at present collected without a statistical department, because each branch of administration wants to know the result of its labours, that it may serve as the basis for the future. These statistics, which contain much precious information, remain mostly in the archives, and are altogether lost to the use of science. We often see the statistical department circumscribed in its labours to the facts of the administration of the university to which it is attached. And often those connected with the same ministry consider this department simply as a scientific institution with which they have nothing to do. It is quite evident that this state of things is neither profitable for the science, the domain of which is so restricted, nor for the administration which is deprived of the assistance of science, and which, by so acting, will always experience a difficulty in collecting all its forces and knowing all its means, because it must seek them out from many offices, in tables drawn up according to plans altogether different and having no relation among themselves. In the opinion of the section there is only one means to remedy the evil and to avoid the inconveniences resulting from the present method of collecting statistics, and that is the centralization of its labours by the formation of Central Statistical Commissions, formed of members from the principal branches of public administration and other persons, who by their studies and by their special knowledge, may assist the practice and resolve the difficulties which belong entirely to science.” The entire question is worthy of the most serious consideration of the Chambers of Commerce of the United Kingdom, the interests of commerce being greatly connected with correct statistics of trade, navigation, value of imports and exports, &c. With respect to the other subjects of inquiry, it may be sufficient to state that the Congress have laid the basis for the statistics of Provident Institutions, including Savings

Banks, Friendly Societies, Tontine Institutions, and Insurance Companies; Statistics of Accidents, such as Accidents in Workshops and Manufactories, Accidents on Roads, Accidents in Mines, and Accidents on Railways; Statistics of Mental Alienation and Statistics of Epidemics; and, lastly, Statistics of Great Cities, including Topographic Situation, Area, Houses, Hygiene, Public Security, Population, Consumption of Produce, Industry, and Commerce, Means of Communication and Transport, Municipal Organisation and Municipal Budgets, Public Charities, Provident Institutions, Statistics of Criminal and Civil Justice, Public Instruction, Religion, and Public Amusements.

A desire was expressed that the programme of the next Congress should embrace the subjects of Finances, Public Instruction, and the statistics of Articles of Food.

The want of assimilating the Moneys, Weights, and Measures of different countries was again felt and expressed by a vote of the Congress. As the question of introducing the decimal system into all monetary institutions is almost ripe for legislation, it is all-important that, in effecting the change, we should obtain a measure as complete as possible, avoiding the usual practice of piece-meal legislation. And inasmuch as a universal tendency exists to remove the differences which separate nations from each other, it is also essential that we should not have to remain still in a state of isolation, but that with equal convenience, and even at some temporary national sacrifice, we should put our institutions of Moneys, Weights, and Measures on a par with those of foreign countries.

It has been proposed to invite the International Statistical Congress to hold its third meeting in London, in 1857. Should such a proposal be realised, the Chambers of Commerce might confer an essential benefit by indicating what special branches of commercial statistics, are found wanting in this and other countries.

The happy cordiality which prevailed among all the Members of Congress, most of whom being individuals of the highest eminence in science, and in official position, and the hospitality and extreme kindness which were manifested by the Minister of Commerce, as President, and by all the Members of the French Statistical Commission, have contributed materially to the success of this great Statistical Assembly, and deserve the grateful acknowledgment of all the delegates and of the governments and learned societies therein represented.

I have the honour to be, gentlemen,

Your obedient servant,

LEONE LEVI.

12, The College, Doctors Commons,
London, 22nd September, 1855.

PUBLIC LIBRARIES ACT.

SIR,—The publication, in your last number, of the Public Libraries Act of last session, suggested to me that you, or some of your obliging correspondents, might be able to inform your readers of the number of towns and parishes in England in which Free Libraries have been established—of any places which have refused to adopt the Act—and of any circumstances connected with the working of the local rate system.

I hope to have the honour of bringing the matter before the Town Council and citizens of Limerick, and as the Act is as yet untried in Ireland, the information I seek for may, if obtained, assist in attaining the object I have in view—the establishment of a Free Library in Limerick.

I am, sir, your very faithful servant,

WM. LANE JOYNT.

Kilkee, County Clare, September 24, 1855.

NORTHERN UNION EXHIBITION.

SIR,—I shall esteem it a great favour if you will insert this note in the columns of your excellent *Journal*, which will give a degree of publicity to the intentions of the Northern Union of Literary and Mechanics' Institutions that otherwise could not be obtained.

At the next annual meeting, which is to be held at Newcastle on the 31st of October, under the presidency of the Right Hon. Earl Grey, an Exhibition of Works of Art and Education will be held in aid of the funds. Through the liberality of the Society of Arts of London, their collection of photographs, together with local productions, will be exhibited.

It is proposed to make the exhibition as much educational as possible; and, to carry out this object, tables will be provided for the display of books, maps, globes, philosophical instruments, models, and all articles appertaining to teaching. Those persons who purpose favouring the exhibition with any of the above objects, are requested to inform me, on or before the 16th of next month, of their intentions, and the prices have to be attached to each article. No such exhibition ever having been held in the north, it will, I have no doubt, be productive of great advantage, by affording teachers an opportunity of examining the most approved plans, which the progressive advances of the age have adopted in teaching.

I am, sir, your obedient servant,

J. L. THORNTON, Hon. Sec.

Gibson-street, Newcastle-on-Tyne,
September 25th, 1855.

PATENT LAW AMENDMENT ACT, 1852.

APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

[From Gazette September 21st, 1855.]

Dated 5th June, 1855.

1287. A. Morton and E. Hunt, Glasgow—Motive power engines.

Dated 20th July, 1855.

1639. W. A. Gilbee, 4, South-street, Finsbury—New material in the manufacture of paper. (A communication.)

1645. F. Moll, Annaberg, Prussia—New materials in the manufacture of paper.

Dated 23rd July, 1855.

1663. C. Goodyear, 25, Avenue-road, St. John's-wood—Wheels for carriages, &c., where india rubber is used.

1665. C. Goodyear, 25, Avenue road, St. John's-wood—Bands for holding papers, &c., where india rubber is used.

Dated 11th August, 1855.

1823. T. Hewitt, Lorn-street, Chester-road, Manchester—Machinery for pulverizing and levigating.

Dated 16th August, 1855.

1865. W. Hudson, Burnley—Stop rods or protectors in power looms.

Dated 18th August, 1855.

1875. Robert Crawford, Beith—Ornamental weaving.

Dated 25th August, 1855.

1930. A. H. Hardy and J. H. Fordoff, North Bierley—Pill and ointment for scorbutic disorders.

Dated 30th August, 1855.

1956. J. Gedge, 4, Wellington-street South, Strand—Galvanizing substances. (A communication.)

Dated 1st September, 1855.

1974. A. M. Job, 22, Halliford-street, Lower-road, Islington, and E. Tomlinson, Barn's Cray, Crayford—India rubber leather cloth, applicable to covering roofs, &c.

Dated 5th September, 1855.

2008. W. Craymer, Bristol—Propelling vessels.

2010. A. Palmieri and J. B. Ferrari, 39, Rue de l'Echiquier, Paris—A new system of construction of ships or vessels. (A communication.)

2012. G. Peacock, Gracechurch-street—Ship building.

2014. I. Nettleship, Derby—Spindle for spinning silk, &c.

Dated 6th September, 1855.

2016. T. Schwartz, New York, U.S.—Heating or cooling aeriform and liquid bodies.

2020. W. A. Gilbee, 4, South-street, Finsbury—Purification and clarification of oils. (A communication.)

Dated 17th September, 1855.

2022. S. Hand, Glington Iron Works, Glington—Combined cake-crushing, oat-bruising, and bean-splitting mill.

2024. R. A. Brooman, 168, Fleet-street—Casting mortars, cannon, &c. (A communication.)

2026. J. Stewart, Preston—Steam boilers for the more effectual consumption of smoke.

2028. L. Dameron, Paris—Construction of carriages.

Dated 6th September, 1855.

2030. H. Hart, 5, Waterloo-crescent, Dover—Lubricating and burning oils. (A communication.)

2034. H. Boucherie, Bordeaux—Impregnating woods with chemical materials, &c.

2036. A. H. A. Durant, Tong-castle, Salop—Raising and lowering weights, and saving persons, &c., from fire.

2038. A. H. A. Durant, Tong-castle, Salop—Apparatus for ascertaining the number of, and distance travelled by, passengers in public carriages.

2040. A. H. A. Durant, Tong-castle, Salop—Sweeping chimnies.
 2042. H. Webster, Dalby-terrace, City-road—Construction of chronometers, clocks, watches, &c.
 2044. J. Panet, Echenoz-la-meline, France—Hydraulic system for propelling on railways, or obtaining motive power and distributing water.
Dated 10th September, 1855.
 2046. C. Hewett, 8, King's-road, Pentonville—Baking ovens.
 2048. J. Rhodes and J. Johnson, Manchester—Steam engines.
Dated 11th September, 1855.
 2052. J. Gimson, Welford-road, Leicester—Feed apparatus for steam boilers.
 2054. G. S. Hinchliff, Piccadilly—Paper hangings. (A communication.)
 2056. F. H. Lebaigue, Little Titchfield-street—Chocolate.
Dated 12th September, 1855.
 2060. J. Higgin, Manchester—Treating madder or preparations of madder.
 2064. J. G. Roger, Trinity-street, Cardiff—Ships' signal lanterns.
Dated 13th September, 1855.
 2068. R. B. Cousens, 50, Hallford-street, Islington—Machinery for making casks.

INVENTIONS WITH COMPLETE SPECIFICATIONS FILED.

2062. J. Partridge and J. Kirkham, West Bromwich—Malt crushers.—12th September, 1855.
 2091. J. Gray, M.D., Nos. 4 and 5, Princes-street, Dublin—Water closet arrangement.—17th September, 1855.
 2100. A. E. L. Bellford, 32, Essex-street, Strand—Fountain lamps. (A communication.)—17th September, 1855.

WEEKLY LIST OF PATENTS SEALED.

Sealed September 22nd, 1855.

645. Frederick Ransome, Ipswich—Improvement in the manufacture of artificial stone.
 650. Robert Joseph Jesty, Great Northern Railway, King's-cross—Improvements in apparatus for indicating between parts of a train of carriages on a railway.
Sealed September 25th, 1855.
 663. John McKinnell, Glasgow—Improvements in ventilation.
 667. Henry Charles Hill, Parker-street, Kingsland—Improvements in the manufacture of waterproof flocked cloth and other fabrics.
 674. John Cooke Bourne, Holmes-terrace, Kentish-town—Improvements in photographic apparatus.
 675. John Gedge, 4, Wellington street South, Strand—Improvements in the mode or modes of transferring designs on to woven, textile, or other fabrics, or on paper, and in the machinery used for such purposes.
 682. John Shae Perring, Radcliffe—Improvements in the permanent way of railways.
 684. François Etienne Hudde and Jean Baptiste Emmanuel Fouquet, 39, Rue de l'Equier, Paris—Improvements in the construction of pyrometers.
 685. William Hutchison, Tonbridge Wells—Improvements in manufacturing artificial stone and in giving colour to the same.
 694. John Gedge, 4, Wellington-street South, Strand—Improvements in the means of stopping or retarding railway trains. (A communication.)
 699. Alexander McDougall, Manchester—Improved method of consuming smoke in steam engine or other furnaces or fireplaces.
 708. William Swain, Birmingham—Improvements in furnaces for jaspers' stoves, ovens, boilers, and kilns, and which improvements are also applicable to other fireplaces, by which combustion is rendered more complete and the fuel thereby greatly economised.
 710. George H. Babcock and Asher M. Babcock, Westerly, U.S.—Improvements in presses for printing in colours, called polychromatic printing presses.
 719. John Bailey Surget, Liddington-place, St. Pancras—Improvements in instruments for threading needles.
 720. William Corbitt, Elm Tree Bank, Rotherham—Improvements in warming and ventilating apartments, parts of which improvements are applicable to the prevention of smoky chimneys.
 721. Robert Hardman, Bolton-le-Moors—Improvements in looms for weaving.
 725. Thomas Russell Crampton, Adelphi—Improvements in locomotive and other steam boiler furnaces.
 740. Thomas Prideaux, Birmingham—Improved plough for draining and other similar purposes.
 751. Samuel Greenwood, Sunderland—Improvements in machinery for making rivets, bolts, nuts, and other similar articles.
 755. Louis Ambroise Michel Mouchel, Paris—Improved method of joining pipes, tubes, and ducts.

759. James Chesterman, Sheffield—Improvements in the manufacture of table and other like knives.
 770. Alexander Rollason, Birmingham—Improvements in photography.
 791. Lord Charles Beauclerk, Riding, Northumberland—Improvements in machinery for tilling and subsoil ploughing.
 795. Léopold Oudry and Alphonse Oudry, Paris—Improvements in preserving wood, metal, and other substances.
 805. James Lee Norton, Holland-street, Blackfriars—Improvements in separating wool and other animal fibres from vegetable matters, and in drying wool and other animal fibres.
 812. William Terry, Francis-street, Aston, Birmingham—Improvements appertaining to breech-loading fire-arms.
 814. Jules Laléman, Lille, France—Improved machinery for combing flax and other similar fibrous materials.
 1007. Samuel Roberts, Hull—Improvements in steam engines.
 1144. Alexander Henry Mentha, Manchester—Improvements in the manufacture of wadding, and in the machinery or apparatus connected therewith.
 1301. Moses Heap, Blackburn—Improvements in machinery or apparatus for "grinding" dye woods or roots, and for other similar pulverizing purposes.
 1335. Isaié Lippmann, 4, Rue Geoffroy Saint Hilaire, Paris—Improvements in dyeing or colouring the hides and skins of animals.
 1385. Thomas Blanchard, 2, Rue Drouot, Paris—Improved method of bending timber.
 1452. Moses Poole, Avenue-road, Regent's-park—Improvements in sculpturing surfaces of marble and stone.
 1570. Samuel Cunliffe Lister, Bradford—Improvements in weaving looped or pile fabrics.
 1573. Richard Hornsby, Spittlegate Iron Works, Grantham—Improvements in thrashing machines.
 1596. William Edward Newton, 66, Chancery-lane—Improvements in vices.
 1603. Henry Samuel Boase, Claverhouse, Bleachfield—Improvements in the process of drying organic substances.
 1618. William Ball, Ilkeston, and John Wilkins, Nottingham—Improvements in the manufacture of warp fabrics.
 1684. Benjamin Bailey, Leicester—Improvements in manufacturing knitted fabrics.
 1722. James Kerr, Bedford-terrace, Trinity-square, Southwark—Improvements in revolver fire-arms.
 1728. Charles Piper, Cambridge—Improvement of gun stocks of every description used both for sporting and military purposes.
 1732. John Hanson, Dough, Belfast—Improvements in machinery or apparatus for digging potatoes.

PATENTS ON WHICH THE THIRD YEAR'S STAMP DUTY HAS BEEN PAID.

20. Charles Frederick Bielefeld, Strand—Improvements in constructing portable houses and buildings.
 49. Edmund Morewood and George Rogers, Enfield—Improvements in coating metals.
 95. William Oxley, Manchester—Improvements in apparatus for heating and drying.
 100. William Potts, Birmingham—Improvements in sepulchral monuments.
 251. Auguste Edouard Loradoux Bellford, 16, Castle-street, Holborn—Improvements in sewing machines.
 296. Alfred Trueman, Swansea—Improvements in obtaining copper and other metals from ores or matters containing them.
 324. Thomas Restell, Strand—Improvements in chronometers, watches, and clocks, part of which improvements is applicable to roasting-jacks.
 407. Charles Henry Waring, Neath Abbey, Glamorganshire—Improvements in the cutting and working or quarrying of coal, stone, shale, clay, and other similar substances, and in machinery for that purpose.
 77. Stephen Soulbey, Ulverston—Improvements in machinery for letterpress printing.
 96. Henry Bridson, Bolton-le-Moors—Improvements in machinery to facilitate the rinsing, washing, and cleansing of fabrics, which machinery is also applicable to certain operations in bleaching and dyeing.
 142. Henry Bernoulli Barlow, Manchester—Improvements in the manufacture of cylinders for carding cotton and other fibrous substances.
 184. Joseph Needham, 26, Piccadilly—Improvements in breech-loading fire-arms, and in apparatus connected therewith.
 260. William Coles Fuller, Bucklersbury, and George Morris Knevit, New York—Improvements in applying Indian-rubber or other similarly elastic substance as springs for carriages.
 545. Charles Benjamin Normand, Havre—Improvements in machinery for sawing wood.

WEEKLY LIST OF DESIGNS FOR ARTICLES OF UTILITY REGISTERED.

No. in the Register.	Date of Registration.	Title.	Proprietors' Name.	Address.
3760	September 20.	Improved Mill Frame.	E. R. and F. Turner	St. Peter's, Ipswich.
3761	" 25.	Llaneker's Smoke Consuming Furnace.	Ravel Linneker	Norton Woodseats.